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10/736,955	12/15/2003	Jizheng Xu	MS1-1694US	5538

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EXAMINER	
WERNER, DAVID N	
ART UNIT	PAPER NUMBER
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

lhptoms@leehayes.com

Office Action Summary	Application No.	Applicant(s)	
	10/736,955	XU ET AL.	
	Examiner	Art Unit	
	David N. Werner	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☒ Claim(s) *6,15,24 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 August 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action for U.S. Patent 10/736,955 is responsive to the Request for Continued Examination file 19 October 2009, in reply to the Final Rejection of 17 July 2009. Currently, Claims 1–36 are pending.

2. In the previous Office action, Claims 1, 10, 19, and 28 were rejected under 35 U.S.C. 112, first paragraph as containing new matter. Claims 1–5, 7–14, 16–23, 25–32, and 34–36 were rejected under 35 U.S.C. 103(a) as obvious over U.S. Patent Application Publication 2003/0058931 A1 (*Zhang*) in view of U.S. Patent Application Publication 2003/0002579 A1 (*Radha*). Claims 6, 15, 24, and 33 were rejected under 35 U.S.C. 103(a) as obvious over *Zhang* in view of *Radha* and in view of U.S. Patent 5,742,343 A (*Haskell*).

Continued Examination Under 37 CFR 1.114

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 19 October 2009 has been entered.

Response to Amendment

4. Applicant's amendments to the claims have been fully considered. The claim rejections under 35 U.S.C. 112, first paragraph are withdrawn.

Response to Arguments

5. Applicant's arguments filed with respect to claim 1 have been fully considered but they are not persuasive. Applicant states in pages 0017–0019 of the *Remarks* filed 19 October 2009 that none of the cited references, in particular the *Zhang* reference, disclose the new claim limitation of "extracting motion vectors from the base layer and skipping coded coefficients and other information at the base layer to transcode the enhancement layer bitstream". In the Final Rejection of 17 July 2009, the examiner acknowledged that in the *Zhang* reference, enhancement layer transcoding is independent of the base layer. *Final rejection*, page 8. However, the examiner also stated that in the *Haskell* reference, a motion estimator in an enhancement layer encoder uses motion vectors from a base layer for motion compensation of the enhancement layer. It is respectfully submitted that this step of passing motion vectors from a base layer to an enhancement layer encoder for enhancement layer motion compensation is the claimed step of extracting motion vectors but not coefficients or other information from the base layer. Applicant briefly mentions in page 19 of the *Remarks* that "the combination of Zhang and Radha (with or without Haskell)" does not disclose this limitation, and states in page 21 of the *Remarks* that "Haskell fails to cure the deficiencies" of claim 1, but does not provide any evidence in support of this

conclusory statement. The rejection of the independent claims is thus modified to include a citation of the *Haskell* reference.

Claim Objections

6. Claims 6, 15, 24, and 33 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The subject matter of claims 6, 15, 24, and 33 has been completely incorporated into the independent claims as presently amended.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1–36 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication 2003/0058931 A1 (*Zhang*) in view of U.S. Patent Application Publication 2003/0002579 A1 (*Radha*) and in view of U.S. Patent 5,742,343 A (*Haskell*).

Zhang teaches a method of transcoding scalable video comprising a base layer and enhancement layer. Regarding independent claim 1, figure 5 of *Zhang* illustrates

the transcoder system, performed in a server for video transmission. *Zhang* at paragraph 0014. After initially encoding the base and enhancement layers, in transcoding, enhancement layer 512 is transcoded in transcoder 540 to output enhancement layer video 519, without transcoding base layer 511. *Id.* at paragraphs 0048, 0050. The transcoded enhancement layer 519 and original base layer 511 may be stored on a disc or transmitted over a network. *Id.* at 0051. Then, transcoder 540 performs the claimed step of decoding the enhancement layer bitstream and the encoded base layer bitstream[1]. This transcoding is performed based on minimizing distortion for a current available bitrate and adjusts rate budget W(a) based on network conditions in a bit-rate allocation scheme. *Id.* at 0054, 0073. Then, Rate-Distortion Extractor 520 performs the claimed step of "determining data throughput characteristics of a network coupled to a client computing device", and "calculating a new HQRB" to determine "how many bits of the enhancement layer bitstream are used to reconstruct a high quality reference image", where W(a) is the HQRB. Then, transcoder 540 which produces the new enhancement layer bitstream performs the claimed step of "encoding the enhancement layer bitstream".

The present invention differs from *Zhang* first in that the present invention determines the new HQRB as the difference between network bandwidth and encoded base layer bandwidth, whereas Zhang calculates a bit rate for the video as a whole, without separating base layer and enhancement layer throughputs; and second in that

[1] As discussed in previous interviews, in the present invention, the encoded base layer is never fully decoded. However, claim 1 as currently presented, appears on its face to disclose a step of decoding the enhancement layer bitstream and the base layer bitstream. It is suggested that the second indentation of

the present invention extracts motion vectors from the base layer for transcoding the enhancement layer, whereas in *Zhang*, the enhancement layer transcoding is completely independent from the base layer.

Radha et al. teaches a system for transmitting video over a variable-bandwidth network, in which the video, comprising a base layer and enhancement residual layers, may change coding according to variable bandwidth. Regarding claim 1, in Radha et al., a selected enhancement layer bitstream is encoded at a rate R(MAX) – R(BL) (paragraph 0049), in which R(MAX) is the maximum available network bandwidth (paragraph 0040), and R(BL) is the bitrate of an encoded base layer (paragraph 0041). If available bandwidth is reduced to a smaller value R less than R(MAX), the transmitter adjusts to output an enhancement layer of bandwidth R - R(BL) (paragraph 0051). Then R – R(BL) is the claimed "difference between the data throughput characteristics of the network and a bit rate of the encoded base layer", and the video output in Radha et al. is "at least partially optimized for the throughput characteristics of the content distribution network".

Zhang discloses a majority of the claimed invention except for determining bit rate of an enhancement layer as the difference between available bit rate and base layer bit rate. Radha et al. teaches that it was known in the art to provide this determination of bitrate. Therefore, it would have been obvious to one having ordinary skill in the art at the time the present invention was made to substitute the enhancement layer bitrate determination control of Radha et al. for the bitrate determination control of

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claim 1 be split into a "producing" step for both the base and enhancement layers, to use the language of

Zhang et al. with the predictable result of producing "a coded residual image which is most appropriate for the available bandwidth", (paragraph 0012), that is to say, "at least partially optimized for the throughput characteristics of the content distribution network", since it has been held that simple substitution of one element in the art for another to obtain predictable results only involves routine skill in the art. *In re Fout*, 675 F.2d 297, 301, 213 USPQ 532, 536 (CCPA 1982); *In re O'Farrell*, 853 F.2d 894, 7 USPQ2d 1673 (Fed. Cir. 1988); *Ruiz v. AB Chance Co.*, 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004); *Ex Parte Smith*, 83 USPQ 2d 1509 (BPAI 2007). However, *Radha* does not resolve the deficiency of extracting motion vectors.

Haskell et al. teaches a scalable video encoder and decoder. Regarding claims 6, 15, 24, and 33, in Haskell et al., the embodiment in figure 20, showing an encoder having a base encoder and an enhancement encoder, is exemplary. In *Haskell*, an encoded base layer picture is made available to transition store 620 in the enhancement encoder. *Haskell*, column 11: lines 55–57; column 12: lines 5–8. Motion estimator 640 compares an enhancement layer frame with a base layer prediction frame, and uses the motion vectors from the enhancement layer in a weighted average with the motion vectors from motion compensation from the previous enhancement layer. *Id.* at column 12: lines 9–42. By placing this weighted average motion compensation system in transcoder 540 of *Zhang*, the present invention is achieved.

Zhang et al., in combination with Radha et al., discloses the claimed invention except for using base-layer motion vectors to encode an enhancement layer in a video

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the specification, and a decoding step for the enhancement layer alone.

coder. Haskell et al. teaches that it was known to perform motion compensation in an enhancement coder from base level motion vectors. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the enhancement layer motion compensation system of Haskell et al. into the enhancement layer transcoder of Zhang et al., since Haskell et al. states in column 29: lines 1-29 that such a modification would increase accuracy of coding enhancement layer data by increasing the number of available sources for motion compensation.

Regarding independent claims 10, 19, and 28, Radha et al. operates on a personal computer (paragraphs 0032-0035).

Regarding claims 2, 11, 20, and 29, as previously mentioned, the enhancement layer rate selection control in Radha et al. was designed to produce the enhancement layer "most appropriate for the available bandwidth" (paragraph 0012).

Regarding claims 3, 12, 21, and 30, Zhang et al. operates on FGS-encoded video (paragraphs 0018–0019).

Regarding claims 4, 13, 22, and 31, in Radha et al., when a receiver bandwidth decreases, an enhancement layer of residual images having a lower bit rate is selected, and regarding claims 5, 14, 23, and 32, in Radha et al., when a receiver bandwidth increases, an enhancement layer of residual images having a higher bit rate is selected (paragraph 0014).

Regarding claim 6, 15, 24, and 33, as mentioned above with respect to claim 1, *Haskell* discloses the claimed step of using motion vectors from the base layer to generate the transcoded enhancement layer.

Regarding claims 7, 16, 25, and 34, in Zhang et al., the base layer 511 and transcoded enhancement layer 512 may be "transmitted through a network 550 synchronously as they are transcoded" (paragraph 0051).

Regarding claims 8, 17, 26, and 35, in Zhang et al., FGS encoder 510 performs the encoding of the base layer and original input enhancement layer (paragraph 0048). Regarding claims 9, 18, 27, and 36, in Radha et al., a maximum bit rate may be determined based on if "the receiving device has sufficient processing power to handle those additional frames" produced at a higher bit rate (paragraph 0005).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. N. W./
Examiner, Art Unit 2621

/Dave Czekaj/
Primary Examiner, Art Unit 2621